Open-Loop Processing & the Zeigarnik Effect in Autism

Unfinished Tasks, Monotropic Attention Tunnels & the Cognitive Architecture of Autistic Task Persistence

AUTYST.MY · 2026 · EVIDENCE-BASED AUTISM EDUCATION

ABSTRACT

Autistic cognition is characterised by a pronounced sensitivity to unfinished tasks and incomplete processes — a phenomenon amplified by the Zeigarnik effect and intensified through monotropic attention allocation. This research brief examines how open-loop cognitive processes (tasks initiated but not completed) create persistent cognitive load in autistic minds, the interaction with monotropism and executive function differences, and the downstream consequences including task completion compulsion, rumination, inertia, and distress at interruption. We propose that the autistic experience of open loops represents a fundamental difference in cognitive closure mechanisms with both significant costs and functional advantages.

1. The Zeigarnik Effect: Foundations & Autistic Amplification

The Zeigarnik effect, first documented by Bluma Zeigarnik (1927), describes the tendency for incomplete tasks to occupy working memory more persistently than completed tasks. In neurotypical cognition, unfinished tasks create a mild cognitive tension that fades relatively quickly as attention shifts to other demands. In autistic cognition, this effect appears substantially amplified.

Several mechanisms contribute to this amplification:

- **Monotropic attention allocation** (Murray et al., 2005): The autistic tendency to channel cognitive resources intensely into a single interest or task means that when a task is interrupted, the entire monotropic tunnel — with its concentrated attentional resources — is disrupted. The cognitive residue of the interrupted task persists with the same intensity with which it was being processed

- **Reduced attentional flexibility:** Difficulty disengaging from one cognitive focus and shifting to another means that incomplete tasks remain 'active' in cognitive processing for longer than in neurotypical cognition

- **Enhanced pattern completion drive:** The autistic preference for completeness, closure, and systematic processing creates a strong cognitive drive to resolve open loops — when this drive cannot be satisfied, the resulting tension is proportionally greater

saraf.my

2. Open Loops & Working Memory Architecture

Open-loop processing refers to cognitive processes that have been initiated but not brought to completion. In computational terms, these are tasks that remain in active memory awaiting resolution. For autistic individuals, the working memory architecture appears to handle open loops differently from neurotypical cognition.

Neurotypical working memory employs efficient **attentional gating mechanisms** that can deprioritise incomplete tasks, moving them from active processing to background storage. Autistic working memory, operating with reduced top-down attentional control and stronger bottom-up persistence, may maintain open loops at a higher level of active processing — consuming working memory capacity that would otherwise be available for new tasks.

This creates a **cumulative cognitive load effect**: each unresolved task occupies a portion of working memory. As the number of open loops increases throughout a day, available cognitive capacity decreases. By late afternoon, an autistic individual may be cognitively depleted not from task difficulty but from the accumulated weight of unresolved processes — each still actively demanding completion.

The interaction with **executive function differences** in autism is critical. Reduced cognitive flexibility and task-switching capacity mean that the 'mental maintenance' required to manage multiple open loops is itself more effortful, compounding the cognitive cost.

3. Task Completion Compulsion & Interruption Distress

The heightened cognitive tension created by open loops manifests in observable behaviours and subjective experiences:

Task completion compulsion describes the intense drive to finish started tasks before transitioning to anything else. This is not rigidity for its own sake but a **cognitive self-regulation strategy** — completing a task closes the open loop, releases the cognitive resources it was consuming, and reduces the overall processing load. Interrupting an autistic person mid-task is cognitively costly not because of inflexibility but because it forces the creation of an additional open loop while the current one remains unresolved.

Interruption distress — the disproportionate emotional response to being interrupted during focused activity — can be understood as the sudden creation of cognitive dissonance between the intense monotropic focus on the current task and the demand to disengage. The cognitive cost of interruption for an autistic individual includes: maintaining the state of the interrupted task in working memory, shifting attentional resources, engaging with the interrupting demand, and managing the emotional response to the forced shift.

saraf.my

Rumination — persistent cycling of thoughts about unresolved situations — may represent the cognitive system's attempt to 'complete' tasks that cannot be physically completed. Social interactions that ended ambiguously, conversations where the 'right' response was identified too late, or problems that lack clear solutions can create persistent open loops that the mind repeatedly revisits in an attempt to achieve closure.

4. Interaction with Autistic Inertia

Autistic inertia — the difficulty initiating, sustaining, or stopping activities — has a bidirectional relationship with open-loop processing. The **difficulty initiating new tasks** may partly reflect the cognitive load of existing open loops: if working memory is substantially occupied by unresolved tasks, the cognitive resources required to initiate a new task may not be available.

Conversely, **difficulty stopping ongoing tasks** (perseveration) may reflect the cognitive system's drive to close the current loop before it becomes another source of persistent load. The autistic tendency to 'need to finish' before stopping can be reframed not as rigid perseveration but as adaptive cognitive load management — closing loops reduces total cognitive burden.

The **transition between tasks** is particularly challenging because it simultaneously requires: closing (or suspending) the current cognitive loop, managing the Zeigarnik tension of leaving it incomplete if not finished, initiating a new cognitive process, and adjusting the attentional system from one focus to another. Each of these steps is individually more effortful in autistic cognition; together, they create a substantial transition cost that explains the observable difficulty with task switching.

5. Functional Advantages

The same cognitive architecture that creates vulnerability to open-loop overload confers significant functional advantages:

- **Deep sustained focus:** The strong drive to maintain and complete cognitive processes enables extended periods of concentrated work that many neurotypical individuals cannot sustain

- **Thoroughness and quality:** The compulsion toward completion produces work that is systematically thorough — every element addressed, every detail attended to

- **Problem persistence:** Complex problems that would be abandoned by neurotypical cognition (which more readily deprioritises unresolved tasks) continue to receive cognitive attention, increasing the probability of eventual solution

- **Systematic processing:** The preference for completing one task before starting another produces organised, sequential work approaches that are highly effective in many professional domains

- **Error detection:** Open loops around potential errors or inconsistencies keep these issues active in awareness until they are resolved, functioning as an internal quality assurance system

6. Support Strategies

Minimise unnecessary interruptions: Recognising the cognitive cost of interruption, support strategies should protect focused work time. 'Do not disturb' periods, advance notice of transitions, and batched communication (rather than continuous interruption) respect the cognitive architecture of open-loop processing.

Provide closure opportunities: Allow natural task completion points before transitions. When interruption is necessary, provide explicit information about when the interrupted task can be resumed — this partially closes the loop by providing a defined resumption plan.

Externalise open loops: Written task lists, progress documentation, and note-taking systems allow cognitive loops to be 'parked' externally rather than maintained in working memory. The act of writing down an incomplete task's status can reduce the cognitive load of maintaining it internally.

Schedule transition buffers: Allow time between activities for the cognitive process of closing one loop and opening another. Rapid back-to-back scheduling creates cascading open loops that accumulate throughout the day.

Leverage task completion drive: Structure work and learning around completable units. Breaking large projects into defined, closeable sub-tasks allows the task completion drive to work constructively rather than creating overwhelm from a single, uncloseable mega-loop.

KEY INSIGHTS

› The Zeigarnik effect is amplified in autistic cognition through monotropic attention and reduced attentional flexibility

› Open loops consume working memory persistently, creating cumulative cognitive load throughout the day

› Task completion compulsion is a cognitive self-regulation strategy, not rigidity — it reduces processing load

› Interruption distress reflects the genuine cognitive cost of forced disengagement from monotropic focus

› Autistic inertia and open-loop processing have a bidirectional relationship — each amplifies the other

› The same architecture enables deep sustained focus, thoroughness, and persistent problem-solving

saraf.my

References

1. Buckley, C., & Pellicano, E. (2020). Thinking about autistic 'camouflaging' through the lens of impression management. *Autism, 24*(7), 1727–1729.

2. Happé, F., & Frith, U. (2006). The weak coherence account: Detail-focused cognitive style in autism. *Journal of Autism and Developmental Disorders, 36*(1), 5–25.

3. Hill, E. L. (2004). Executive dysfunction in autism. *Trends in Cognitive Sciences, 8*(1), 26–32.

4. Murray, D., Lesser, M., & Lawson, W. (2005). Attention, monotropism and the diagnostic criteria for autism. *Autism, 9*(2), 139–156.

5. Phung, J., Penner, M., Engel, L., & Goh, S. (2021). What I wish you knew: Insights on burnout, inertia, meltdown, and shutdown from autistic adults. *Autism in Adulthood, 3*(2), 120–130.

6. Zeigarnik, B. (1927). Über das Behalten von erledigten und unerledigten Handlungen. *Psychologische Forschung, 9*, 1–85.

7. Kenworthy, L., Yerys, B. E., Anthony, L. G., & Wallace, G. L. (2008). Understanding executive control in autism. *Neuropsychology Review, 18*(4), 320–338.

saraf.my